

# The Effect of Cognitive Processing Therapy on Cognitions: Impact Statement Coding

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*This study compared the cognitions of 37 female rape survivors before and after completing cognitive processing therapy (CPT). It was hypothesized that CPT would be associated with reductions in posttraumatic stress disorder (PTSD) symptoms and problematic (i.e., assimilated and overaccommodated) thoughts as well as increases in the number of realistic (i.e., accommodated) cognitions. Cognitions were assessed via coding and analyses of participants' written impact statements at the beginning and end of treatment. Posttraumatic stress disorder symptoms were assessed with the Clinician-Administered PTSD Scale and PTSD Symptom Scale. As predicted, there were significant increases in accommodated statements and significant decreases in overaccommodated and assimilated statements. The hypothesis that cognitive changes would be related to symptom reduction was partially supported.*

A growing body of research has explored the relationship between traumatic events and subsequent cognitions. For instance, survivors sometimes exhibit self-blaming thoughts and guilt about actions that they did or did not engage in during a traumatic incident (Foa, Ehlers, Clark, Tolin, & Orsillo, 1999; Frazier & Schauben, 1994; Janoff-Bulman & Wortman, 1977; Kubany, 1994; Resick, Nishith, Weaver, Astin, & Feuer, 2002; Resick & Schnicke, 1993). Because of their experiences, survivors sometimes develop cognitive distortions, which are inaccurate thoughts. Foa and Rothbaum (1997) proposed that posttrauma cognitions can be classified into two general categories: beliefs that the world is dangerous and thoughts about being incompetent. A more elaborated theory by McCann, Sakheim, and Abrahamson (1988) delineated trauma-related cognitive distortions in five areas: agency—which refers to the attributed cause of a traumatic event—safety, trust, power, esteem, and intimacy.

Consistent with the cognitive processing theories of McCann and Pearlman (1990), Resick and Schnicke (1993) suggested that when individuals are confronted with new information that is inconsistent with preexisting schemas (i.e., stored bodies of knowledge), one of two processes occurs: assimilation or accommoda-

tion. Piaget (1987) was the first to describe these two processes. Assimilation is the incorporation or alteration of new information to fit into existing schemas. Accommodation is the modification of existing schemas to incorporate new events and information. In trauma survivors, these processes often involve the themes of agency, safety, trust, power, esteem, and intimacy.

Resick and Schnicke (1993) proposed that although accommodation is necessary to integrate a new event, traumatized individuals sometimes overaccommodate trauma-relevant information. They noted that overaccommodation occurs when schema changes are inaccurate and overgeneralized. For instance, an overaccommodated belief is that people are either totally in control or out of control of life events.

Assimilation, on the other hand, can occur by incorporating new, unchanged information into a preexisting schema, or by modifying the perception of a new event to sustain the previous beliefs. If someone believes that being in a dark parking garage in a high-crime neighborhood is dangerous and then is attacked in such a location, the memory of the traumatic event would not be modified. Instead, it would be assimilated with no adjustment of beliefs needed. In other words, it is logical to incorporate the assault into

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a preexisting schema about the consequences of being in high-risk places. On the other hand, it would be problematic if this same person concluded that the assault was his or her fault because of a prior assumption that people get what they deserve because the world is fair. In this second instance, the person would be left wondering what he or she did to deserve such misfortune. Because the survivor believes that people get what they deserve, he or she will likely assimilate this event by saying, "the assault must be my fault because I failed to prevent it or must have done something to deserve it." Here the person mistakenly attributes the cause of the assault (i.e., agency) to himself or herself, and thus, inappropriately assimilates it into the preexisting fair world schema. Assimilation may also be reflected by after-the-fact attempts to undo the traumatic event. For instance, a survivor might say, "I keep thinking of ways I could have stopped it from happening." This is a statement that reflects a lack of acceptance of the event's outcome.

Researchers have explored the link between inaccurate, trauma-related cognitions and symptomatology. Trauma survivors with posttraumatic stress disorder (PTSD) often exhibit negative beliefs about self and others (Ali, Dunmore, Clark, & Ehlers, 2002; Janoff-Bulman, 1989; Koss, Figueredo, & Prince, 2002; Newman, Riggs, & Roth, 1997; Owens & Chard, 2001). Self-blame and trauma-related guilt have also been associated with PTSD and other psychopathological reactions, such as depression (Foa et al., 1999; Frazier & Schauben, 1994; Kubany et al., 1996; Kubany & Manke, 1995; Resick et al., 2002; Wenninger & Ehlers, 1998). In adults who experienced child sexual abuse, correlations have been found between maladaptive beliefs regarding safety, trust, esteem, intimacy, and PTSD symptoms (Wenninger & Ehlers, 1998). Similarly, Owens and Chard (2001) examined 53 adult survivors of child sexual abuse and found that PTSD severity was correlated with cognitive distortions on all seven subscales of the Personal Beliefs and Reactions Scale (Resick, Schnicke, & Markway, 1991).

In addition to the literature linking inaccurate thoughts to psychopathology, research reveals that cognitions may change along with PTSD symptoms following trauma-focused treatment (Foa & Rauch, 2004). Cognitive processing therapy (CPT) is an evidence-based, 12-session treatment that employs cognitive therapy and written accounts to reduce PTSD and other comorbid symptoms (Resick & Schnicke, 1993). A primary goal of CPT is to help clients develop accommodated, balanced views of traumatic events to replace inappropriately assimilated or overaccommodated beliefs. For instance, clients are encouraged to recognize that they could not have prevented the event, and that it was not their fault, thus addressing distortions in their beliefs about control and agency. The results of a study conducted by Resick and colleagues (2002) revealed that guilt-related thoughts were reduced with CPT. Furthermore, women who completed CPT-Sexual Abuse version (CPT-SA), which is a 17-session adaptation of CPT for child sexual abuse survivors, also showed significant reductions in distortions pertaining to safety, trust, power, control, esteem, intimacy, and undoing (Owens, Pike, & Chard, 2001). Recently, in their dis-

mantling study of CPT, Resick et al. (2008) found reductions in PTSD symptoms, guilt, shame, and overall cognitive distortions as measured by the Personal Beliefs and Reactions Scale.

With the limitations of the existing literature in mind, the current study examined client impact statements to identify assimilated, accommodated, and overaccommodated thoughts. Previous studies on cognitive change have typically employed self-report inventories of cognitive distortions, which limit the response options available to participants and focus on content rather than process. What has not been attempted to date is to assess cognitions in a less-restrictive manner and to examine the processes of assimilation, accommodation, and overaccommodation. In the current study, the authors addressed this issue by coding clients' written impact statements to examine accommodated, overaccommodated, and assimilated thoughts along with symptom change. Impact statements are written essays that CPT clients produce at the onset of treatment and again before the last therapy session. In these statements, clients describe the personal meaning of the traumatic event and how it has affected their view of themselves, other people, and the world. After assimilated, accommodated, and overaccommodated thoughts were identified, they were entered as variables into a series of quantitative statistical analyses.

There are four primary hypotheses in this study. First, we predicted that cognitive changes could be identified by examining beginning and end-of-treatment impact statements, and that thoughts could be reliably coded as examples of assimilation, accommodation, or overaccommodation. Second, we hypothesized that there would be an increase in the number of appropriately accommodated statements and a decrease in the number of overaccommodated and inappropriately assimilated statements across the course of treatment. Third, it was expected that higher rates of overaccommodated and assimilated statements would be positively correlated with PTSD symptoms. Finally, we hypothesized that higher rates of accommodation would be associated with fewer symptoms.

## METHOD

### Participants

The current study was part of a larger treatment-outcome study comparing CPT to prolonged exposure therapy (PE) and a minimal attention (MA) waitlist control condition (Resick et al., 2002). Participants were women who were 18 years of age or older. To be eligible for the study, clients needed a current diagnosis of PTSD resulting from a childhood or adulthood rape that had occurred 3 or more months prior to assessment. The following are exclusion criteria: substance dependence within the past 6 months, recent changes in psychotropic medications, current parasuicidal behavior or suicidal intent, mental retardation, illiteracy, and currently being stalked or in a violent relationship.

Participants were 37 women who were assigned to and completed the CPT condition, or who were originally assigned to the

minimal attention condition and then were randomly assigned to and completed the CPT condition. The CPT completers were excluded if both the initial and final impact statements were not available. Analysis of participants' data in this sample revealed that a mean of 9 years had elapsed since the worst assault ( $M = 107$  months,  $SD = 105$ ). Of the total sample, 84% of the women were Caucasian ( $n = 31$ ) and 14% were African American ( $n = 5$ ). The women reported an average of 15.3 years of education ( $SD = 2.4$ ). Of the total sample, 57% of the women were single ( $n = 21$ ), 24% were married or cohabiting ( $n = 9$ ), and 16% were divorced ( $n = 6$ ).

## Measures

The Clinician-Administered PTSD Scale (CAPS; Blake et al., 1990) is a 22-item structured interview used to obtain a PTSD diagnosis that has excellent psychometric properties with respect to reliability and validity (Blake et al., 1995). Clinicians rate the frequency and intensity of each PTSD symptom on a 0–4 scale. For each symptom, a frequency rating of 1 or higher, coupled with an intensity rating of 2 or higher, is considered to be clinically significant. A diagnosis of PTSD is given when participants report at least one reexperiencing, at least three avoidance, and at least two arousal symptoms. Total CAPS scores are derived by summing the total intensity and frequency ratings.

The PTSD Symptom Scale (PSS) is a 17-item self-report scale that measures the reexperiencing, avoidance/numbing, and arousal symptoms of PTSD. In a sample of rape survivors, the PSS has shown high test-retest reliability, satisfactory internal consistency, and good concurrent and convergent validity (Foa, Riggs, Dancu, & Rothbaum, 1993).

## Procedure

Independent evaluators who were blind to condition assignment assessed participants using a variety of self-report and clinician-administered measures. Eligible participants were randomly assigned to one of three conditions: CPT, PE, or Minimal Attention (MA). Upon completing the MA condition, participants were randomly assigned to CPT or PE. Participants were assessed at pretreatment and between 1 and 2 weeks posttreatment and then subsequent follow-up periods. They were paid for each completed assessment.

At the end of the first CPT session, participants were assigned to write an impact statement about the meaning of the rape. At the end of treatment, just before the last session, clients were asked to write a similar impact statement, but were instructed to write about what they believed "now." The impact statement instructions follow.

Please write at least one page on what it means to you that you were raped. Please consider the effects the rape

has had on your beliefs about yourself, your beliefs about others, and your beliefs about the world. Also consider the following topics while writing your answer: safety, trust, power/control, esteem, and intimacy.

A coding manual was developed to reliably measure and operationally define the accommodated, assimilated, and overaccommodated thoughts that were reflected in participants' impact statements. For instance, statements that reflected balanced, accurate evaluations of oneself, others, and the world (e.g., "I realize that some people cannot be trusted.") were coded as accommodated. In contrast, inaccurate, overgeneralizations about oneself, others, and the world (e.g., "People are always trying to control me.") were coded as overaccommodated. Statements that indicated self-blame, denial, or attempts to change the event after the fact (e.g., "I just keep thinking if I had fought harder, I could have stopped him.") were indicative of assimilation. Finally, statements that did not fall into any of the aforementioned categories were classified as informational statements, such as factual descriptions of the trauma, descriptions of how the study participant thought or felt in the past, nonevaluative or ambiguous statements, and comments describing noncognitive, emotional reactions that occurred at the time of the traumatic event.

Numerous coding decision rules were established. For instance, clauses, rather than complete sentences, were coded as independent units because a single sentence often contained multiple cognitions (e.g., both an accommodated and an assimilated thought). This approach was consistent with the procedures used by Foa, Molnar, and Cashman (1995) in coding rape narratives.

Another decision rule involved inferring cognitions from participants' statements. Clients frequently made statements that expressed cognitions in the form of emotions and/or behaviors. For example, instead of saying, "I *believe* that all men are dishonest," which implies cognition, some participants would state, "I *feel* that all men are dishonest," which suggests emotion. Similarly, participants sometimes expressed their beliefs via the use of behavioral descriptions. For instance, they made statements such as, "I have been trusting others again," which implies behavior, versus, "I now *believe* that some people can be trusted," which implies thought. Although researchers and clinicians make a distinction between thoughts, behaviors, and emotions, sometimes laypersons, such as clients, have a more difficult time with this task; therefore, if thoughts were clearly implied despite a participant's use of noncognitive language, the rule was to code the statements as cognitions.

The manual also contained examples of accommodated, overaccommodated, and assimilated statements to aid coders in classifying ambiguous responses. For example, some statements written in question form were coded as informational whereas others were coded as accommodated, overaccommodated, or assimilated. The question, "Why did this happen?" was considered too ambiguous to be interpreted as an overaccommodated, accommodated, or assimilated thought (although such a statement might imply belief

**Table 1.** Means, Standard Deviations, and Results of Repeated Measures MANOVA of Changes in the Number of Clauses for Each Type of Cognition From Beginning to End of Therapy

Clause type	Beginning number		Ending number		<i>F</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Accommodation	5.24	6.66	18.92	16.35	26.28***
Overaccommodation	23.11	17.56	5.24	6.75	45.21***
Assimilation	2.46	3.86	0	0	15.06***
Informational	55.95	52.39	33.19	24.20	6.30*
Total # of clauses	86.76	67.33	57.35	36.05	6.56*

\* $p < .05$ . \*\*\* $p < .001$ .

in a just world); therefore, it was coded as an informational statement. In contrast, the question, "Why don't I have any control?" implies perceived loss of power; thus, it would be coded as an overaccommodated statement.

Three coders (i.e., two doctoral-level fellows and a graduate student) comprised the team that established the initial interrater reliability. First, one of the clinicians numbered the impact statement clauses and then distributed the statements to all three members of the team for coding. The three coders were then trained to an interrater reliability to at least 80% agreement. The practice impact statements were only used to develop the coding manual and to achieve reliability; thus, they were not included in the final study analyses. Two of the three coding team members went on to participate in the next stage of interrater calculations.

In the second phase of reliability establishment, a team consisting of two coders who had already been trained to 80% agreement examined the impact statements that were entered into the final statistical analyses. First, in an attempt to avoid biased coding, information that identified the statements as being either beginning or end-of-treatment was removed by one of the team members. One team member coded all of the 74 pre- and posttreatment impact statements and the other team member coded 15 of these statements to determine interrater reliability for 20% of the final study sample. The two coders obtained a final interrater agreement of 84% and a Cohen's kappa of .76.

## RESULTS

Paired-sample  $t$  tests indicated that participants reported changes in symptom levels and cognitions when comparing the beginning versus the end of treatment. As was found in the main study (Resick et al., 2002) the participants in this subsample reported significant reductions in total scores on the CAPS after completing a course of CPT,  $t(36) = 13.21$ ,  $p < .001$ . The average total CAPS score for the sample at the beginning of treatment was  $M = 74.05$ , ( $SD = 20.52$ ) and was 22.62 ( $SD = 19.48$ ) at the end of treatment. Regarding diagnostic criteria, at the beginning of treatment 100%

of the 37 participants met full criteria for PTSD. At the end of treatment, eight women (i.e., 22%) still met the diagnostic criteria. Mean PSS scores also decreased from the start of therapy ( $M = 29.47$ ,  $SD = 8.37$ ) to the end of treatment ( $M = 9.53$ ,  $SD = 7.98$ ),  $t(34) = 12.01$ ,  $p < .001$ .

A repeated measures MANOVA was performed to assess whether participants exhibited changes in the number of assimilated, accommodated, overaccommodated, informational, and total number of clauses in their final impact statements. The women's essays showed significant increases in the number of accommodated clauses and significant decreases in the number of assimilated, overaccommodated, informational, and total clauses when comparing beginning and end-of-treatment impact statements,  $F(4,33) = 28.43$ , Pillai's trace = .78,  $p < .001$ . Results of univariate tests are reported in Table 1.

The end-of-treatment impact statements were significantly shorter than the first statements, so the data were also analyzed with regard to change in the percentage of each type of clause (e.g., number of assimilated clauses divided by total number of clauses). A repeated measures MANOVA revealed a significant increase in the percentage of accommodated clauses and a significant decrease in the percentage of assimilated and overaccommodated clauses (see Table 2),  $F(3,34) = 102.62$ , Pillai's trace = .90,  $p < .001$ .

**Table 2.** Means, Standard Deviations, and Results of Repeated Measures MANOVA of Changes in Percentages of Clauses for Each Type of Cognition From Beginning to End of Therapy

Clause type	Beginning %		Final %		<i>F</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Accommodation	.05	.05	.34	.20	68.65***
Overaccommodation	.34	.21	.10	.13	47.72***
Assimilation	.03	.06	0	0	11.56**
Informational	.58	.21	.56	.18	$\leq 1$

\*\* $p < .01$ . \*\*\* $p < .001$ .

**Table 3.** Pearson Correlations Among Cognitions in the Impact Statements and Total PSS and CAPS Scores at the Beginning and End of Therapy

Clause type	Pretreatment		Posttreatment	
	PSS	CAPS	PSS	CAPS
Accommodation – clause number	–.25	–.13	–.10	–.14
Accommodation – clause percentage	–.41*	–.25	–.41*	–.34*
Overaccommodation – clause number	.23	.28	.45**	.38*
Overaccommodation – clause percentage	.24	.11	.63**	.55**
Assimilation – clause number	.07	.16	–	–
Assimilation – clause percentage	–.18	–.04	–	–

Note. PSS = PTSD Symptom Scale; CAPS = Clinician-Administered PTSD Scale.

\*  $p < .05$ . \*\*  $p < .01$ .

Pearson product-moment correlations were performed to explore the relationships between accommodated, overaccommodated, and assimilated clauses and CAPS and PSS for the beginning-of-treatment impact statements. Table 3 shows the correlations among the total number of accommodated, overaccommodated, and assimilated clauses, the percentage of each type of clause, and the pretreatment scores. The only significant result was a negative correlation between percentage of accommodated clauses and PSS scores.

Table 3 also displays the correlations between the end-of-treatment percentage and number of accommodated and overaccommodated statements, and the scores on the CAPS and PSS. Information on assimilated statements was not included in this table because none of the clauses in the final impact statements were coded as assimilated. The number and percentage of clauses coded as overaccommodated were significantly and positively related to both of the measures assessing PTSD. The percentage of accommodated clauses was negatively correlated with both of the outcome measures as well.

Finally, Table 4 contains the correlations between the beginning and end-of-treatment PTSD symptoms and changes in the number and percentage of cognitions. Changes in the number and percentage of accommodated clauses were significantly and negatively correlated with the change in PSS scores. This finding demonstrates that as statements became accommodated, participants' PSS self-report scores decreased. Finally, the change in the percentage of overaccommodated clauses was significantly and positively correlated with the change in PSS scores. No other relationships were significant.

## DISCUSSION

The current study found that it was possible to observe, record, and reliably code the number and percentage of assimilated, overaccommodated, and accommodated statements that rape survivors produced in their impact statements at the beginning and end

**Table 4.** Pearson Correlations Among Changes in Cognitions From the Beginning to End of Therapy and Changes in PSS and CAPS Scores From the Beginning to End of Therapy

Changes in clause type	Changes in assessment scores	
	PSS	CAPS
Accommodation – clause number	–.40*	–.28
Accommodation – clause percentage	–.33*	–.26
Over-accommodation – clause number	.21	.12
Over-accommodation – clause percentage	.44**	.21
Assimilation – clause number	–.04	.08
Assimilation – clause percentage	–.10	.13

Note. PSS = PTSD Symptom Scale; CAPS = Clinician-Administered PTSD Scale.

\*  $p < .05$ . \*\*  $p < .01$ .

of a course of CPT. Although the methodology was not identical, the findings of the current study are compatible with those of a prior study that coded therapy material (Ehlers et al., 1998). Ehlers and colleagues found that of 20 women who had been sexually assaulted, those showing the fewest gains from exposure-based therapy had a variety of inaccurate thoughts pertaining to mental defeat, alienation, and a sense of permanent, negative life change. These authors proposed that such cognitions might be successfully modified using cognitive restructuring and exposure-based treatment.

In support of the impact of cognitive-behavioral treatments, the current study found that a course of CPT was associated with altered thoughts. As hypothesized, there were significant decreases in the number and percentage of overaccommodated and assimilated clauses from the start to the end of therapy. In addition, as predicted, there was an increase in the number and percentage of accommodated clauses. For instance, one client's pretreatment, assimilated statement was that she felt "tons of guilt"; however, her

end-of-treatment, accommodated statement was that “it wasn’t my fault, it was his.” Additionally, her pretreatment, overaccommodated belief was that she needed “to be in control at all times” or “I can’t breathe.” In contrast, at the end of therapy she stated, “I have learned to trust my own instincts.” This shift revealed a more accommodated belief. These results are consistent with studies that have found that a course of CPT reduces the severity of cognitive distortions as measured by quantitative assessment instruments (Owens et al., 2001; Resick et al., 2002, 2008).

Partial support was found for the prediction that higher rates of overaccommodation and assimilation would be related to greater symptomatology, and that more accommodation would accompany lower symptom levels. At the beginning of treatment, only the percentage of accommodated clauses was significantly and negatively correlated with self-reported PTSD symptoms. It is possible that there was no correlation between PTSD and overaccommodation at pretreatment because of ceiling effects. At the end of treatment, however, the number and percentage of overaccommodated clauses was significantly and positively related to PTSD symptoms (i.e., both self-reported and clinician-rated). Additionally, the percentage of accommodated clauses was significantly and negatively correlated with self-reported and clinician-rated PTSD symptoms. These findings were consistent with prior studies showing significant relationships between distorted cognitions and symptoms.

Finally, we predicted that reductions in assimilation and overaccommodation and increases in accommodation would be related to decreases in symptoms over the course of treatment. Such a relationship was found between changes in accommodation and overaccommodation and self-reported PTSD scores. This finding supports the idea that trauma survivors who made stronger, positive, cognitive changes also achieved greater levels of symptom relief.

Although many of the study hypotheses were supported, a limitation was that it was often clear to the coders whether the impact statement was written at the beginning or the end of treatment, even after removing identifying information. When coding the content of the statements, it was not possible to disguise a stated or implied change in beliefs from pre- to posttreatment (e.g., “Before therapy, I used to believe this, but now I think. . .”).

Another finding that needs further explanation is the lack of significant relationships between assimilation and PTSD. At the end of treatment, we found that none of the 37 participants generated assimilated statements. One explanation for this finding is that CPT helped clients identify and challenge self-blaming or undoing thoughts. Prior research supports this interpretation by demonstrating that self-blaming, assimilated thoughts have been linked to PTSD (Kubany & Manke, 1995) and that recovery from PTSD is associated with reductions in guilt cognitions and shame (Resick et al., 2002, 2008). An alternative explanation for the lack of relationship between assimilation and PTSD is that even at the beginning of treatment, the base rate of assimilation was low (i.e., an average of only 2.5 statements). This result is probably due to

reduced statistical power resulting from a low pretreatment rate of assimilated clauses as well as a lack of assimilated clauses at the conclusion of therapy.

A possible explanation for the low base rate of assimilated statements is that the impact statement instructions may not have sufficiently encouraged clients to explore their assimilated thoughts. This hypothesis must be considered, particularly given the strong association that has been found between PTSD and assimilated beliefs (e.g., denial, self-blame, undoing) in prior investigations (e.g., Frazier & Schauben, 1994; Kaysen, 2003; Kubany et al., 1996; Kubany & Manke, 1995; Owens et al., 2001; Wenninger & Ehlers, 1998). The instructions for the impact statement did not prompt clients to explore their beliefs about the cause of the rape; thus, there were likely fewer assimilated statements than there might have been with different instructions. In the latest version of the CPT manual (Resick, Monson, & Chard, 2007), the impact statement assignment explicitly asks for the client’s beliefs about the causes of the traumatic event as well as the implications for the person’s life. Future research might be able to examine whether these new impact statements result in more assimilated statements.

Another potential issue is that the impact statement instructions may have suggested a frame of understanding, which in turn, biased the clients’ responses. Piaget (1987) proposed that people engage in assimilation and accommodation as they form schemas, which are constructions of reality that arise as a result of how one processes environmental information. In the impact statement instructions, participants were asked to “consider the following topics while writing your answer: safety, trust, power/control, esteem, and intimacy.” It is possible that their responses were unduly influenced by the suggestion of specific themes, which in turn, increased the likelihood of producing particular types of statements.

More limitations include the lack of ethnic minority participants and the fact that PTSD did not remit in a portion of the clients. Because 84% of the participants were Caucasian and only 14% were African American, we were not able to conduct statistical analyses to examine potential differences in cognitions as a function of ethnicity; thus, it is not possible to generalize the findings of this study to ethnic minority groups. It is also noted that at pretreatment, everyone in the study met full criteria for PTSD; at the end of treatment, 22% met the criteria. We do not fully understand why some people respond to treatment whereas others do not. We hypothesize that perhaps some clients may not be as skilled in challenging their faulty cognitive assumptions, or they may be less flexible in their reasoning processes; however, this is an area that needs further exploration.

Study participants showed large reductions in PTSD across time as well as changes in cognitions; however, the causal explanation for these changes is somewhat ambiguous. It is possible that CPT helped clients to reappraise and contextualize their traumatic events, developing more balanced views about their assaults, and that these cognitive changes were related to reductions in PTSD. It could also be the case, however, that exposure to the traumatic

event via therapy resulted in extinction of PTSD symptoms and that cognitive change was a byproduct of that process. It is also possible that a third factor, such as increased hope or self-efficacy, produced reductions in both distorted cognitions and symptom levels. Research utilizing longitudinal designs that can examine mediation with larger samples is needed to further explore these potential causal pathways. Additionally, future investigations might compare the impact statements of successful treatment clients with those of treatment nonresponders to analyze whether positive changes in cognitions occur in the absence of symptom reduction.

In summary, the current investigation provides support for the utility of cognitive-behavioral interventions in reducing inaccurate thoughts. Given the encouraging findings of this investigation, as well as those of other studies, we may tentatively conclude that CPT is related to reductions in trauma-related cognitive distortions. Future research replicating and extending these findings would be a welcome addition to the treatment literature. More in-depth qualitative analysis may also provide a complement to our understanding of cognitive processes in recovery from PTSD.

## REFERENCES

- Ali, T., Dunmore, E., Clark, D., & Ehlers, A. (2002). The role of negative beliefs in posttraumatic stress disorder: A comparison of assault victims and nonvictims. *Behavioural and Cognitive Psychotherapy*, 30, 249–257.
- Blake, D. D., Weathers, F. W., Nagy, L. M., Kaloupek, D. G., Gusman, F. D., Charney, D. S., et al. (1995). The development of a Clinician-Administered PTSD Scale. *Journal of Traumatic Stress*, 8, 75–90.
- Blake, D. D., Weathers, F. W., Nagy, L. M., Kaloupek, D. G., Klauminzer, G., Charney, D. S., et al. (1990). A clinician rating scale for assessing current and lifetime PTSD: The CAPS-1. *Behavior Therapist*, 18, 187–188.
- Ehlers, A., Clark, D. M., Dunmore, E., Jaycox, L., Meadows, E., & Foa, E. B. (1998). Predicting response to exposure treatment in PTSD: The role of mental defeat and alienation. *Journal of Traumatic Stress*, 11, 457–471.
- Foa, E. B., Ehlers, A., Clark, D. M., Tolin, D. F., & Orsillo, S. M. (1999). The Posttraumatic Cognitions Inventory (PTCI): Development and validation. *Psychological Assessment*, 11, 303–314.
- Foa, E. B., Molnar, C., & Cashman, L. (1995). Change in rape narratives during exposure therapy for posttraumatic stress disorder. *Journal of Traumatic Stress*, 8, 675–690.
- Foa, E. B., & Rauch, S. A. (2004). Cognitive changes during prolonged exposure versus prolonged exposure plus cognitive restructuring in female assault survivors with posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology*, 72, 879–884.
- Foa, E. B., Riggs, D. S., Dancu, C. V., & Rothbaum, B. O. (1993). Reliability and validity of a brief instrument for assessing posttraumatic stress disorder. *Journal of Traumatic Stress*, 6, 459–473.
- Foa, E. B., & Rothbaum, B. O. (1997). *Treating the trauma of rape*. New York: Guilford Press.
- Frazier, P., & Schauben, L. (1994). Causal attributions and recovery from rape and other stressful life events. *Journal of Social and Clinical Psychology*, 13, 1–14.
- Janoff-Bulman, R. (1989). Assumptive worlds and the stress of traumatic events: Applications of the schema construct. *Social Cognition*, 7, 113–136.
- Janoff-Bulman, R., & Wortman, C. B. (1977). Attributions of blame and coping in the “real world”: Severe accident victims react to their lot. *Journal of Personality and Social Psychology*, 35, 351–363.
- Kaysen, D. L. (2003). The role of assimilation and over-accommodation in post-traumatic stress disorder (Doctoral dissertation, University of Missouri-St. Louis, 2003). *Dissertation Abstracts International*, 64(5-B), 2391.
- Koss, M. P., Figueredo, A. J., & Prince, R. J. (2002). Cognitive mediation of rape's mental, physical, and social health impact: Test of four models in cross-sectional date. *Journal of Consulting and Clinical Psychology*, 70, 926–941.
- Kubany, E. S. (1994). A cognitive model of guilt typology in combat-related PTSD. *Journal of Traumatic Stress*, 7, 3–19.
- Kubany, E. S., Haynes, S. N., Abueg, F. R., Manke, F. P., Brennan, J. M., & Stahura, C. (1996). Development and validation of the Trauma-Related Guilt Inventory (TRGI). *Psychological Assessment*, 8, 428–444.
- Kubany, E. S., & Manke, F. M. (1995). Cognitive therapy for trauma-related guilt: Conceptual basis and treatment outlines. *Cognitive and Behavioral Practice*, 2, 27–61.
- McCann, L., & Pearlman, L. A. (1990). *Psychological trauma and the adult survivor: Theory, therapy, and transformation*. New York: Brunner/Mazel.
- McCann, I. L., Sakheim, D. K., & Abrahamson, D. J. (1988). Trauma and victimization: A model of psychological adaptation. *The Counseling Psychologist*, 16, 531–594.
- Newman, E., Riggs, D., & Roth, S. (1997). Thematic resolution, PTSD, and complex PTSD: The relationship between meaning and trauma-related diagnoses. *Journal of Traumatic Stress*, 10, 197–213.
- Owens, G. P., & Chard, K. M. (2001). Cognitive distortions among women reporting childhood sexual abuse. *Journal of Interpersonal Violence*, 16, 178–191.
- Owens, G., P., Pike, J. L., & Chard, K. M. (2001). Treatment effects of cognitive processing therapy on cognitive distortions of female child sexual abuse survivors. *Behavior Therapy*, 32, 413–424.
- Piaget, J. (1987). *Possibility and necessity* (Vol. 2; H. Feider, Trans.). Minneapolis, MN: University of Minnesota Press. (Original work published in 1983).
- Resick, P. A., Galovski, T. E., Uhlmansiek, M. O., Scher, C. D., Clum, G. A., & Young-Xu, Y. (2008). A randomized clinical trial to dismantle components of cognitive processing therapy for posttraumatic stress disorder in female victims of interpersonal violence. *Journal of Consulting and Clinical Psychology*, 76, 243–258.
- Resick, P. A., Monson, C. M., & Chard, K. M. (2007). *Cognitive processing therapy: Veteran/military version*. Washington, DC: Department of Veterans' Affairs.
- Resick, P. A., Nishith, P., Weaver, T. L., Astin, M. C., & Feuer, C. A. (2002). A comparison of cognitive processing therapy with prolonged exposure therapy and a waiting list condition for the treatment of chronic posttraumatic stress disorder in female rape victims. *Journal of Consulting and Clinical Psychology*, 70, 867–879.
- Resick, P. A., & Schnicke, M. K. (1993). *Cognitive processing therapy for rape victims: A treatment manual*. Newbury Park, CA: Sage.
- Resick, P. A., Schnicke, M. K., & Markway, B. G. (1991, November). The relation between cognitive content and PTSD. Paper presented at the 25th Annual Convention of the Association for the Advancement of Behavioral Therapy, New York, NY.
- Wenninger, K., & Ehlers, A. (1998). Dysfunctional cognitions and adult psychological functioning in child sexual abuse survivors. *Journal of Traumatic Stress*, 11, 281–300.